

## Claims

1. An electrical power unit comprising:  
a combustion chamber, in which fuel is combusted to release heat; and  
a thermionic converter, which converts said heat into electrical energy;  
and  
an energy control system;  
wherein said control system takes an input representative of the demand for electrical power and computes and controls the intake of fuel and air into said combustion chamber.
2. The electrical power unit of claim 1 wherein said thermionic converter is a thermotunneling converter.
3. The electrical power unit of claim 1 wherein said thermionic converter comprises low work function electrodes.
4. The electrical power unit of claim 1 additionally comprising a fuel intake, wherein said fuel intake is attached to said combustion chamber, wherein said fuel intake comprises a compressor for compressing said fuel prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
5. The electrical power unit of claim 1 additionally comprising an air intake, wherein said air intake is attached to said combustion chamber, wherein said air intake comprises a compressor for compressing said air prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
6. A motive unit comprising:  
the electrical power unit of claim 1; and  
an electric motor powered by said electrical energy;  
wherein said input representative of the demand for electrical power correlates to: the desired speed of said electric motor; and to the load on said electric motor.
7. The motive unit of claim 6 wherein said thermionic converter is a thermotunneling converter.

8. The motive unit of claim 6 wherein said thermionic converter comprises low work function electrodes.
9. The motive unit of claim 6 wherein said electric motor is a multi-phase electric motor.
10. The motive unit of claim 6 additionally comprising a fuel intake, wherein said fuel intake is attached to said combustion chamber, wherein said fuel intake comprises a compressor for compressing said fuel prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
11. The motive unit of claim 6 additionally comprising an air intake, wherein said air intake is attached to said combustion chamber, wherein said air intake comprises a compressor for compressing said air prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
12. The motive unit of claim 6 additionally comprising an energy storage system, wherein electrical energy produced by said thermionic converter may be stored, wherein said energy storage system is selected from the group consisting of: an electrical battery, a flywheel, and a fuel cell, and wherein said input representative of the demand for electrical power correlates to: the desired speed of said electric motor; the load on said electric motor; and the amount of energy stored in said energy storage system.
13. The motive unit of claim 6 wherein said input representative of the demand for electrical power is provided by a throttle controlled by a human operator.
14. An automobile comprising the motive unit of claim 6 wherein said motor converts said electrical energy into rotational energy, wherein said rotational energy provides motive power to said automobile.
15. The automobile of claim 14 wherein said thermionic converter is a thermotunneling converter.
16. The automobile of claim 14 wherein said thermionic converter comprises low work function electrodes.

17. The automobile of claim 14 wherein said electric motor is a multi-phase electric motor.
18. The automobile of claim 14 additionally comprising a fuel intake, wherein said fuel intake is attached to said combustion chamber, wherein said fuel intake comprises a compressor for compressing said fuel prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
19. The automobile of claim 14 additionally comprising an air intake, wherein said air intake is attached to said combustion chamber, wherein said air intake comprises a compressor for compressing said air prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
20. The automobile of claim 14 additionally comprising an energy storage system, wherein electrical energy produced by said thermionic converter may be stored, wherein said energy storage system is selected from the group consisting of: an electrical battery, a flywheel, and a fuel cell, and wherein said input representative of the demand for electrical power correlates to: the desired speed of said electric motor; the load on said electric motor; and the amount of energy stored in said energy storage system.
21. The automobile of claim 14 wherein said input representative of the demand for electrical power is provided by a throttle controlled by a human operator.
22. The automobile of claim 14 additionally comprising an energy recovery system, whereby electrical energy is recovered when said automobile is undergoing braking or when said automobile is traveling down an incline, and wherein said energy recovery system is selected from the group consisting of: an electrical battery, a flywheel, and a fuel cell.
23. An auxiliary power unit comprising: the electrical power unit of claim 1; and one or more ancillary units, wherein said one or more ancillary units are selected from the group consisting of: a conditioning means to provide electrical energy at the required voltage and frequency, an electrical compressor means powered by the electrical energy for providing bleed air, and an electrical compressor means powered by the

electrical energy for providing hydraulic power; wherein said energy control system takes an input representative of the demand for electrical power from said one or more ancillary units and computes and controls the intake of fuel and air into the combustion chamber.

24. The auxiliary power unit of claim 23 wherein said thermionic converter is a thermotunneling converter.
25. The auxiliary power unit of claim 23 wherein said thermionic converter comprises low work function electrodes.
26. The auxiliary power unit of claim 23 additionally comprising a fuel intake, wherein said fuel intake is attached to said combustion chamber, wherein said fuel intake comprises a compressor for compressing said fuel prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
27. The auxiliary power unit of claim 23 additionally comprising an air intake, wherein said air intake is attached to said combustion chamber, wherein said air intake comprises a compressor for compressing said air prior to its introduction to said combustion chamber, and wherein said compressor is controlled by said energy control system.
28. The auxiliary power unit of claim 23 additionally comprising an energy storage system, wherein said energy storage system is selected from the group consisting of: an electrical battery, a flywheel, and a fuel cell, wherein electrical energy produced by said thermionic converter may be stored, and wherein said input representative of the demand for electrical power additionally correlates to the amount of energy stored in said energy storage system.
29. An aircraft comprising the auxiliary power unit of claim 23 wherein said auxiliary power unit provides one or more services to the aircraft, wherein said one or more services are selected from electrical power, bleed air and hydraulic power.